

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A delay locked loop (DLL) block to generate a delay locked clock signal by delaying an external clock signal in a semiconductor device, comprising:

a clock buffer to receive the external clock signal and an inverted signal of the external clock signal to generate a plurality of internal clock signals;

a clock divider to receive one of the internal clock signals and a control signal based on a column address strobe (CAS) signal to generate a plurality of divided signals, each having a predetermined pulse width adjusted by the control signal, and output a selected divided signal as the divided signal; and

a DLL circuit to receive the plurality of internal clock signals and the divided signal to generate the delay locked clock signal.

2. (Previously Presented) The DLL block as recited in claim 1, wherein the DLL circuit includes:

a plurality of delay lines, each delay line having a plurality of unit delays, to delay the plurality of internal clock signals and the divided signal;

a delay model to delay an output of the plurality of delay lines for a predetermined delay time to generate a feedback signal;

a phase comparator to compare a phase of a reference clock signal generated by the clock divider with a phase of the feedback signal to generate a comparison signal, wherein the reference clock signal is an inverted version of the divided signal;

a shift controller to generate a shift right signal or a shift left signal according to the comparison signal; and

a shift register to adjust delay amount of the delay lines in response to the shift right signal or the shift left signal.

3. (Currently Amended) The DLL block as recited in claim 1, wherein the clock divider includes:

a first divider to receive the one of the internal clock signals to generate a first divided signal having a first pulse width and a first period;

a second divider to receive the first divided signal to generate a second divided signal having the first pulse width and a second period and a third divided signal having a second pulse width and the second period;

a selector to selectively output the second divided signal and the third divided signal according to the control signal; and

a third clock divider to receive an output of the selector to generate the divided signal.

4. (Previously Presented) The DLL block as recited in claim 3, wherein the first divider includes:

a 1st NAND gate to perform a NAND operation by receiving the one of the internal clock signals;

a 2nd NAND gate to perform a NAND operation by receiving the one of the internal clock signals;

a 1st inverter to invert one of the internal clock signals;

a 3rd NAND gate to perform a NAND operation by receiving an output signal of the 2nd NAND gate;

a 4th NAND gate, which is cross-coupled with the 3rd NAND gate, to output the first divided signal by performing a NAND operation for an output signal of the 1st NAND gate;

a 5th NAND gate to perform a NAND operation by receiving output signals of the 3rd NAND gate and the 1st inverter;

a 6th NAND gate to perform a NAND operation by receiving output signals of the 4th NAND gate and the 1st inverter;

a 7th NAND gate to perform a NAND operation by receiving an output signal of the 6th NAND gate and outputting an output signal to the 2nd NAND gate; and

a 8th NAND gate, which is cross-coupled with the 7th NAND gate, to perform a NAND operation by receiving an output signal of the 5th NAND gate and outputting an output signal to the 1st NAND gate.

5. (Previously Presented) The DLL block as recited in claim 4, wherein the second divider includes:

a 9th NAND gate to perform a NAND operation by receiving the first divided signal;

a 10th NAND gate to perform a NAND operation by receiving the first divided signal;

a 2nd inverter to invert the first divided signal;

a 11th NAND gate to perform a NAND operation by receiving an output signal of the 10th NAND gate;

a 12th NAND gate, which is cross-coupled with the 11th NAND gate, to output the second divided signal by performing a NAND operation for an output signal of the 9th NAND gate;

a 13th NAND gate to perform a NAND operation by receiving output signals of the 11th NAND gate and the 2nd inverter;

a 14th NAND gate to perform a NAND operation by receiving output signals of the 12th NAND gate and the 2nd inverter;

a 15th NAND gate to perform a NAND operation by receiving an output signal of the 14th NAND gate and outputting an output signal to the 10th NAND gate; and

a 16th NAND gate, which is cross-coupled with the 15th NAND gate, to perform a NAND operation by receiving an output signal of the 13th NAND gate and outputting an output signal to the 9th NAND gate.

6. (Previously Presented) The DLL block as recited in claim 3, wherein the selector includes:

a first pass gate to pass the second divided signal to the second clock divider when the control signal is in a first logic level; and

a second pass gate to pass the third divided signal to the second clock divider when the control signal is in a second logic level.

7. (Previously Presented) The DLL block as recited in claim 5, wherein the third divider includes:

a 17th NAND gate to perform a NAND operation by receiving an output signal of the selector;

a 18th NAND gate to perform a NAND operation by receiving the output signal of the selector;

a 3rd inverter to invert the output signal of the selector;

a 19th NAND gate to perform a NAND operation by receiving an output signal of the 18th NAND gate;

a 20th NAND gate, which is cross-coupled with the 19th NAND gate, to perform a NAND operation for an output signal of the 17th NAND gate;

a 21st NAND gate to perform a NAND operation by receiving output signals of the 19th NAND gate and the 3rd inverter;

a 22nd NAND gate to perform a NAND operation by receiving output signals of the 20th NAND gate and the 3rd inverter and outputting a reference signal;

a 23rd NAND gate to perform an NAND operation by receiving an output signal of the 22nd NAND gate and outputting an output signal to the 18th NAND gate; and

a 24th NAND gate, which is cross-coupled with the 23rd NAND gate, to perform a NAND operation by receiving an output signal of the 21st NAND gate and outputting an output signal to the 17th NAND gate.

Claims 8-14 (Canceled)